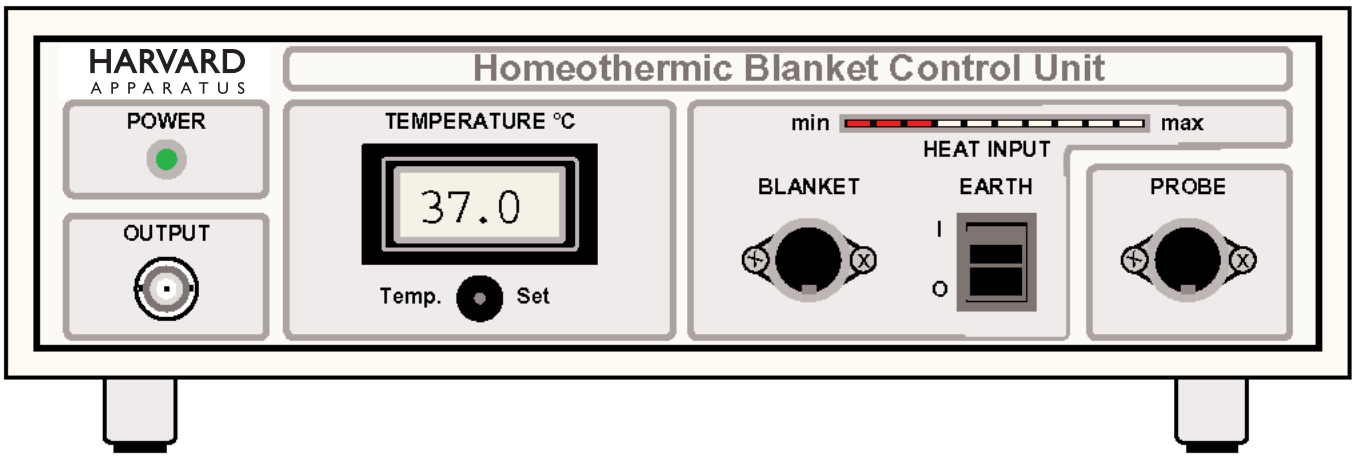
Homeothermic Blanket System Instruction Manual



HARVARD
APPARATUS

Models Covered by this manual:

Systems with Flexible Probes :

50-7053-F Harvard Homeothermic Blanket System Small 115V 60Hz
50-7061-F Harvard Homeothermic Blanket System Small 230V 50Hz
50-7079-F Harvard Homeothermic Blanket System Medium 115V 60Hz
50-7087-F Harvard Homeothermic Blanket System Medium 230V 50Hz
50-7095-F Harvard Homeothermic Blanket System Large 115V 60Hz
50-7103-F Harvard Homeothermic Blanket System Large 230V 50Hz

Systems with Rigid Probes :

50-7053	Harvard Homeothermic Blanket System Small 115V 60Hz
50-7061	Harvard Homeothermic Blanket System Small 230V 50Hz
50-7079	Harvard Homeothermic Blanket System Medium 115V 60Hz
50-7087	Harvard Homeothermic Blanket System Medium 230V 50Hz
50-7095	Harvard Homeothermic Blanket System Large 115V 60Hz
50-7103	Harvard Homeothermic Blanket System Large 230V 50Hz

Control Units :

50-7129	Harvard Homeothermic Blanket Control Unit Only 115V 60Hz
50-7137	Harvard Homeothermic Blanket Control Unit Only 230V 50Hz

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Homeothermic Blanket System Instruction Data

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Introduction

General Description

The HARVARD Homeothermic Blanket System is a closed loop temperature control and stabilisation system. Utilising a small rectal probe to monitor temperature, and a heating blanket to provide heat input, subject temperatures can be accurately controlled.

The control unit varies the current flowing through the heating blanket in an inversely proportional manner to the temperature monitored by the temperature probe.

A regulated DC power supply is used to drive the heating blanket, this provides a high degree of safety and minimum interference.

A large liquid crystal display on the control unit shows the probe temperature and a 10 segment LED bar array indicates the current heat input level.

A BNC socket on the front panel of the control unit provides the user with an analogue output to make external temperature monitoring possible using a chart recorder or similar instrument.

The blanket is enclosed in a protective plastic cover and may be folded without risk of internal damage as the internal heating element is made of highly flexible cable.

Precautions

This Equipment has been designed for use with an earthed mains supply and should not be operated when not earthed.

Connect the power cable of the unit to a suitable three pin plug in accordance with the following :

BROWN	wire	LIVE	terminal of your plug
BLUE	wire	NEUTRAL	terminal of your plug
GREEN/YELLOW		EARTH	terminal of your plug

Before operating the HARVARD Homeothermic Blanket System ensure that the mains supply voltage is correct.

The system is factory set to 110 Volts or 230 Volts (50/60Hz) as required, there is a voltage ID label on the rear panel (see page 7 item 5).

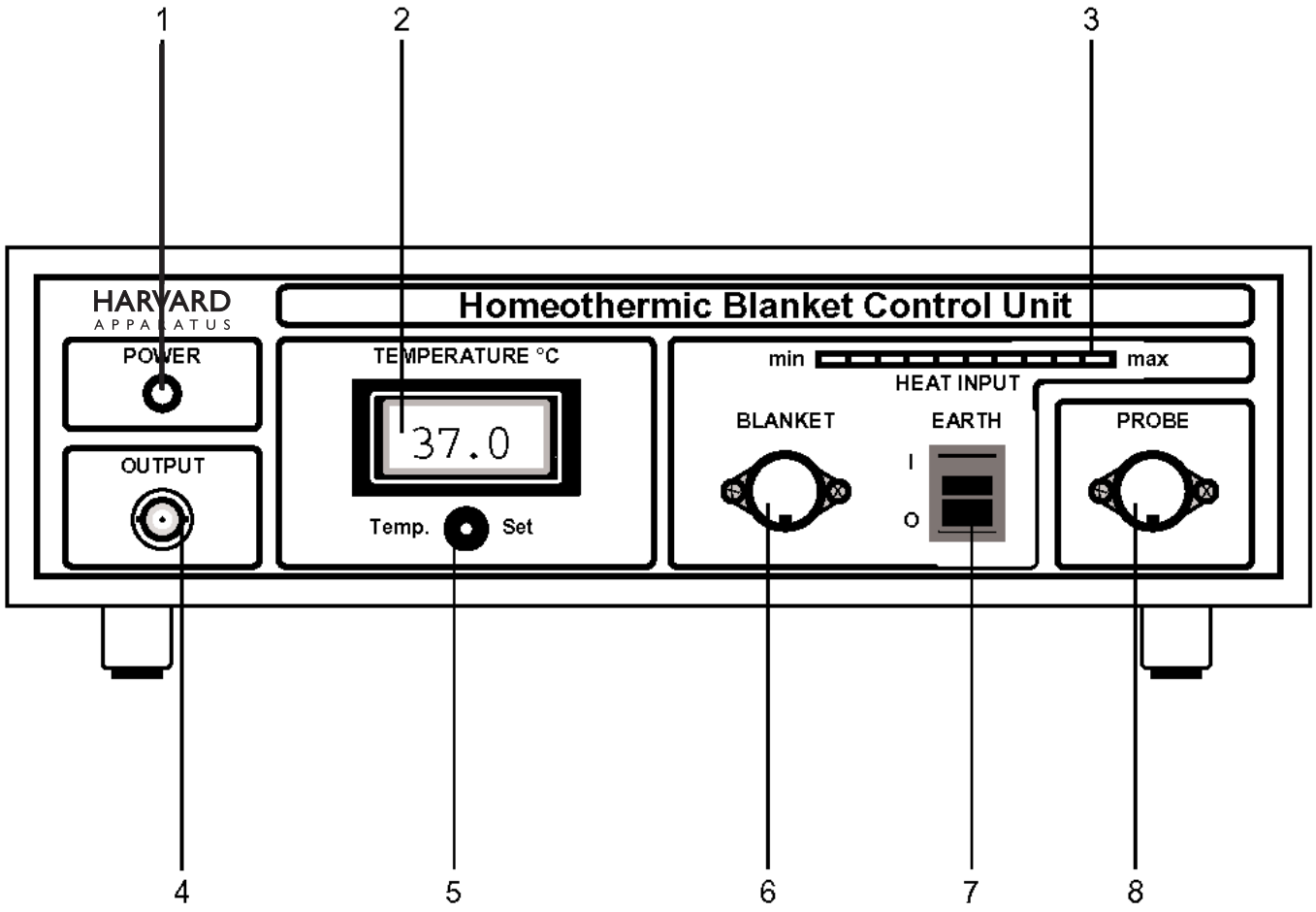
The rear panel mounted mains inlet socket also incorporates the mains fuse and a single spare fuse.

Fuses should only be replaced with those of an identical type: (1 Amp Quick Blow - 20mm Anti-Surge)

When replacing the mains fuse always ensure the equipment is disconnected from the mains supply.

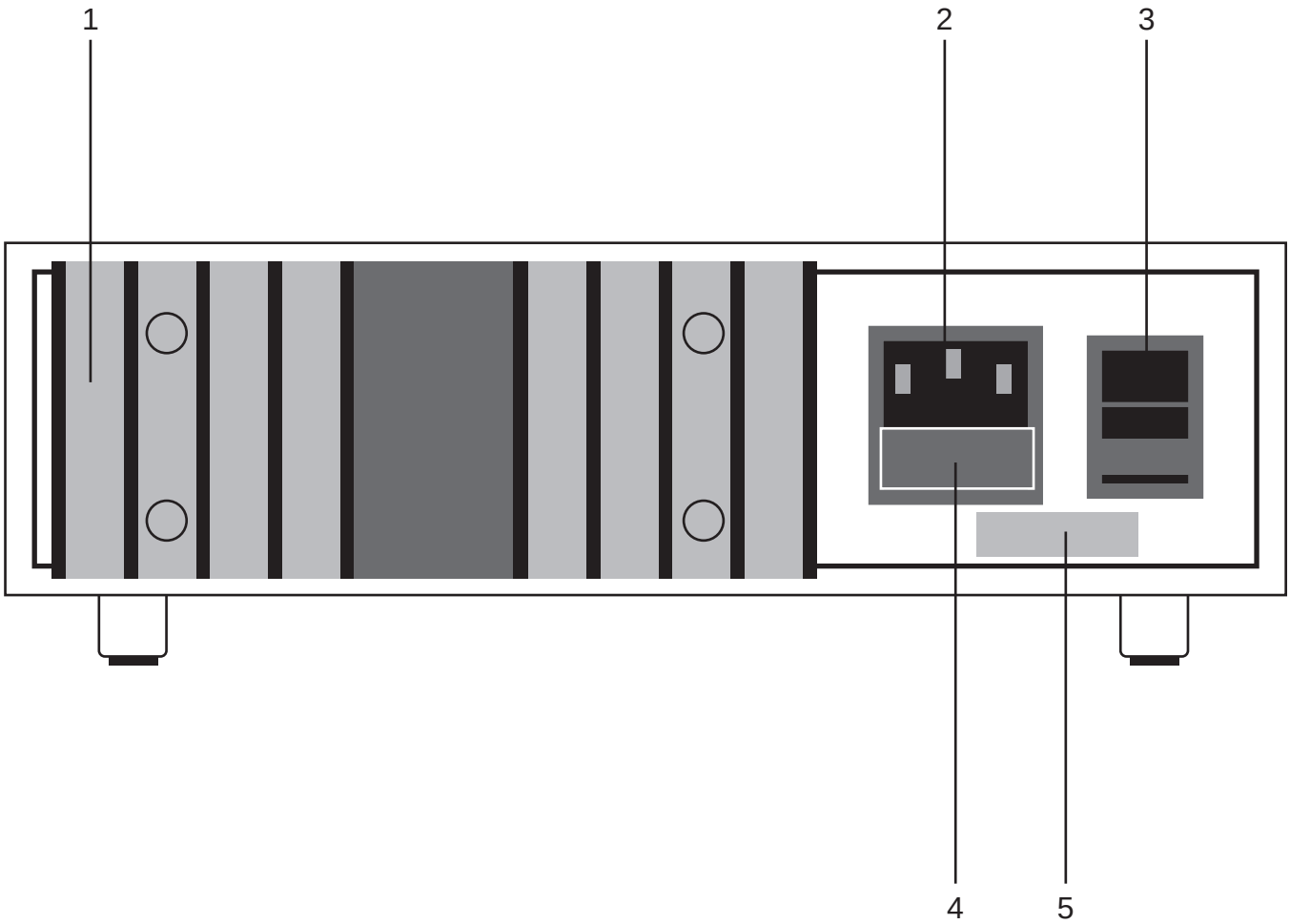
This unit is intended for **animal** use **only.** Neither we nor our agents can be held responsible should this notice be disregarded.

Front Panel Layout



1	Power On Indicator	5	Temperature Set Control
2	LCD Temperature Display	6	Blanket Output Socket
3	Heat Input Display	7	Earth Switch
4	Analogue BNC Output Socket	8	Probe Input Socket

Rear Panel Layout



1	Heatsink	4	Fuse Holder
2	Mains Inlet Socket	5	Voltage ID Label
3	Mains Switch		

Switching On

Connect the control unit rear panel mounted mains inlet socket (see page 7 item 2) to the appropriate mains supply and switch on using the rear panel mounted mains switch(see page 7 item 3).

The Green POWER indicator (see page 6 item 1) will illuminate.The LCD TEMPERATURE display (see page 6 item 2) will also indicate the current probe temperature, if a probe is connected. If a probe is not connected the display should show approximately 44° Centigrade.

The HEAT INPUT indicator array (see page 6 item 3) may also be illuminated if the current temperature is less than about 38° Centigrade.

Connection and use of the Blanket

Connect the blanket to the control unit using the front panel mounted BLANKET SOCKET(see page 6 item 6).

Do NOT remove the blanket from its protective cover.

Since the ability of the system to control the temperature of the animal depends on how intimately the animal is in contact with the blanket, the animal should be wrapped closely in the blanket, using tapes if necessary to keep the blanket in place.

It is advisable to use the blanket from the start of the operation or experimental procedure, so that the animals temperature stabilises.

Where possible, preheat the blanket by switching the system on half an hour before use is required, with the temperature probe folded inside the blanket.

Connection and use of the Probe

Connect the probe to the control unit using the front panel mounted PROBE SOCKET (see page 6 item 8).

The rectal probe is a small temperature sensing device. when the probe is connected, the control unit temperature display will indicate the current temperature of the probe. If no probe is connected the display will show a high reading of approximately 44° Centigrade. This ensures that should a probe fault occur the unit will stop heating.

Adjusting the Set Temperature

Once the Probe and Blanket have been connected to the control unit, the system is ready for use.

The system is factory set to stabilise at 37° Centigrade.

To change the stabilisation point first insert the probe into a fold in the blanket.

Switch the system on and allow sufficient time for the blanket to warm up.

Adjust the front panel mounted TEMP SET control (see page 6 item 5), using a small flat bladed screwdriver (care should exercised when making this adjustment not to apply excessive force as this may lead to serious damage of the control), until the desired temperature is achieved (clockwise rotation of this control increases the temperature stabilisation point).

Allow 10 to 15 minutes after making this adjustment for the system to stabilise at the new setting and re-adjust if necessary.

As this is a heating system only, it is pointless to set the temperature below ambient temperature.

The temperature display is accurate only at temperatures between 35° and 40° Centigrade.

Analogue Output

A BNC socket is provided on the front panel of the control unit (see page 6 item 4), allowing the user to monitor the temperature, between 35° and 40° Centigrade, using a recording device (such as the Harvard TR2 Chart Recorder).

The output from the BNC socket is a small electrical signal corresponding to the current temperature. At 35°C the output will be 50mV and at 40°C the output will be 150mV. This equates to 20mV / °C between 35°C and 40°C.

Blanket Earthing

The blanket is electrically floating with respect to earth. One end of the blanket heating element may be earthed by the front panel mounted EARTH switch (see page 6 item 7).

Adjustment of the Temperature Display

Hazardous voltages are present inside this unit apparatus. Any internal adjustments or servicing should be undertaken only by a competent person.

Ensuring the power supply to the unit is disconnected, remove the top cover of the control unit. This is achieved by removing the 4 large countersunk screws on the underside of the unit. These screws are located in the 4 "ribbed" areas of the lower cover.

Switch the system on and place the probe into a beaker or bath of water at a controlled 37° Centigrade and wait for about 30 seconds.

Using a small flat bladed screwdriver adjust VR1 (see the diagram on page 14) until the display reads 37.

Place the probe into another beaker or bath of water, this time at a controlled 40° Centigrade.

Adjust VR2 (see the diagram on page 14) until the display reads 40.

It may be necessary to repeat this process several times to obtain greater accuracy.

Replacement of the Blanket Fuse

The blanket fuse protects the system should a faulty blanket be connected. If the system fails to heat the blanket and the heat input array does not illuminate it is likely that the fuse has blown.

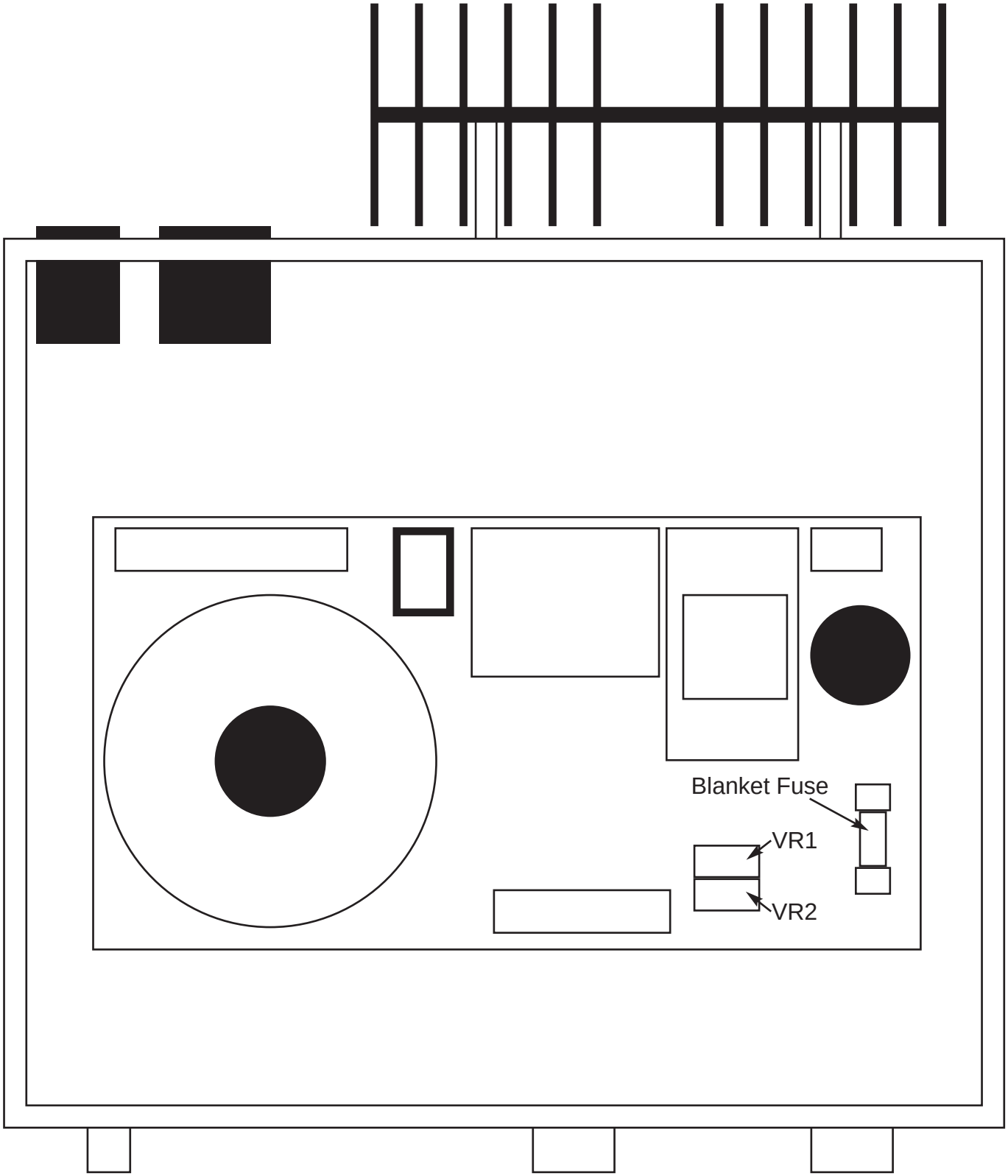
Replacement of the Blanket Fuse

The blanket fuse is located inside the unit and can be accessed by removing the top cover, as described above. Locate the fuse (see diagram on page 14) and replace with one of an identical type (6.3 Amp 20mm).

Cleaning the Blankets

As the blankets are enclosed in plastic covers, the fabric of them should remain clean. If it is necessary to clean a blanket, it may be carefully washed, by hand, after which it must be thoroughly dried before use.

Internal Layout



Technical Specification

Control Unit

Blanket Power	Maximum power input to the blanket is 40 Watts. Power is supplied continuously (not switched) and is level is dependent on the temperature monitored by the probe.
Ripple Output	Less than 10mV RMS
Warm Up Time	20 minutes (20°C to 37°C)
Temperature Accuracy	+/- 1% of actual temperature (35°C to 40°C)
Temperature Stability	Better than 0.01°C/°C (control unit output power with respect to control unit temperature)
Temperature Range	35°C to 40°C monitored on the front panel LCD
Analogue Output	50 mV @ 35°C to 150mV @ 40°C (20mV/°C)
Dimensions	274mm x 320mm x 94mm (WxHxD)
Weight	3Kgs (approx)

Blanket

Dimensions	Rat : 150mm x 200mm Cat : 450mm x 700mm Dog : 600mm x 900mm
Material	Viscose/Nylon (the blanket is supplied with a removable plastic cover)
Connector	5 Pin Din plug

Probe

Types	3mm Flexible PTFE 1.6mm Rigid Stainless Steel
Impedance at 35°C	1371 Ohms
Connector	2 Pin Din plug

Harvard Apparatus Ltd.
FIRCROFT WAY, EDENBRIDGE, KENT, TN8 6HE, ENGLAND
Tel: (01732) 864001 Fax: (01732) 863356 E-Mail: harvard@twins.co.uk